of these references and the rejections over the references are closely related, Applicant respectfully traverses the rejections together.

The Mani references disclose apparatuses for producing salts by electrodialysis that include cells in which a cathode is adjacent to a cationic side of a bipolar membrane, the anionic side of the bipolar membrane and an adjacent anionic membrane form a salt/base compartment, the anionic membrane and a cationic side of a second adjacent bipolar membrane form an acid compartment, the anionic side of the second bipolar membrane and a second anionic membrane form a second salt/base compartment, and the second anionic membrane is adjacent to an anode. *See* Mani 236 at Fig. 1(a), col. 1, lines 16-31, col. 4, lines 24-48; Mani 225 at Abstract, FIG. 1(A), col. 4, lines 26-49. The first bipolar and anionic membranes of the Mani references define a unit cell that may be repeated to form multi-cell units between a cathode and an anode. *Id.* Based on these disclosures, the Office Action takes the position that each of the Mani references anticipates independent claim 12 and its dependent claims 13-14. Applicant respectfully disagrees.

Independent claim 12 sets forth an "electrodialysis or electrolysis apparatus for separating a fermentation broth into a residual stream comprising multivalent ions and lactate ions, comprising a first compartment which is limited by an anion-selective or non-selective membrane and a cathode, which further comprises means for introducing the fermentation broth, and a second compartment limited by the anion-selective or non-selective membrane and an anode, which further comprises means for removing lactic acid, and optionally means to recycle the residual stream to the fermentation broth." Claims 13 and 14 depend from claim 12 and incorporate all of the limitations thereof.

The apparatus of claim 12 "separates a fermentation broth into a residual stream comprising multivalent ions and lactate ions." By treating fermentation broths that include multivalent ions, the claimed apparatus differs from conventional apparatuses. As discussed

in the specification, multivalent ion fouling of membranes was thought to inhibit electrodialysis processes. *See* Specification, page 1, lines 20-23. Multivalent ions were commonly removed before electrodialysis. *See* Specification, page 1, lines 23-24.

The Mani references, which teach electrodialysis processes and apparatuses for obtaining lactic acid from sodium and ammonium lactate, teach removing multivalent ions to prevent fouling. *See* Specification, page 2, lines 1-14; Mani 236, Abstract; Mani 225, Abstract. Specifically, the Mani references teach removing multivalent ions by chelation and nanofiltration. *See* Mani 236 at Abstract, col. 1 lines 16-35, col. 3 lines 23-40, col. 9 line 24 - col. 10 line 25; Mani 225 at Abstract, col. 7 lines 23-38, col. 8 lines 32-44, col. 12 lines 50-65. That is, the Mani references each teach an apparatus in which multivalent ions are removed – by filtration as chelates – prior to separation by electrodialysis of monovalent ions and lactate. Thus, neither of the Mani references teach an "electrodialysis or electrolysis apparatus for separating a fermentation broth into a residual stream comprising multivalent ions and lactate ions," at least because neither Mani reference teaches that multivalent ions may be present in the residual stream.

For at least the above reasons, independent claim 12 and its dependent claims 13 and 14 are patentable over each of Mani 236 and Mani 225. Accordingly, reconsideration and withdrawal of the rejections are respectfully requested.

II. Claim Rejections Under §103

The Office Action rejects claims 1-11 and 15 under 35 U.S.C. §103(a) over Mani 236 and also rejects claims 1-11 and 15 under 35 U.S.C. §103(a) over Mani 225. Because the disclosures of these references and the rejections over the references are closely related, Applicant respectfully traverses the rejections together.

Independent claim 1 sets forth, in pertinent part, a "method of separating multivalent ions and lactate ions from a fermentation broth comprising a multivalent ion lactate salt by

using an electrodialysis or electrolysis apparatus, the method comprising: introducing the broth into a first compartment, said broth having a multivalent ion concentration of at least 0.1 mole/l ... ; converting the multivalent ion to obtain a residual stream comprising a hydroxide of the multivalent ion." Claims 2-11 depend, directly or indirectly, from claim 1 and incorporate all of the limitations thereof.

The Office Action applies the same teachings of Mani 236 and Mani 225 to independent claim 1 and its dependent claims 2-11 as was applied to claims 12-14, discussed above. The Office Action admits that neither Mani 236 nor Mani 225 teach or suggest a method of separating multivalent lactate ions from a fermentation broth that contains at least 0.1 mole/l of multivalent ions and less than 300 g/l of lactate ions. Based on the methods associated with the Mani 236 and Mani 225 apparatuses, the Office Action takes the position that claims 1-11 would have been obvious over each Mani reference. Applicant respectfully disagrees.

As discussed above, the Mani references each teach apparatuses and methods in which multivalent ions are removed prior to separation by electrodialysis of monovalent ions and lactate. Neither Mani 236 nor Mani 225 teaches, and neither Mani reference suggests, a method which includes "introducing the broth into a first compartment, said broth having a multivalent ion concentration of at least 0.1 mole/l ... ; converting the multivalent ion to obtain a residual stream comprising a hydroxide of the multivalent ion," as set forth in independent claim 1. Instead, Mani 236 and Mani 225 each only teach methods in which multivalent ions are removed and the broth introduced into the Mani electrodialysis apparatuses includes monovalent ions and lactate. *See* Mani 236 at Abstract, col. 1 lines 16-35, col. 3 lines 23-40, col. 9 line 24 - col. 10 line 25; Mani 225 at Abstract, col. 7 lines 23-38, col. 8 lines 32-44, col. 12 lines 50-65.